IS6030 – Data Management
Spring Semester 2016

Instructor:
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Required Course Materials: Provided by Instructor

Suggested Materials:
TBD (No required book(s) for the class, book recommendations will be given during the first class)

Summary
This course provides an introduction to database concepts and manipulating and extracting data from structured databases using Structured Query Language-specifically Transact-SQL.

Course Objectives
• Provide an overview of database fundamentals
• Learn basic to advance SQL
• Connect databases to analytical tools (R/Tableau) to help perform data analysis

Course Prerequisites
• Must be in a graduate level Business/Data Analytics academic program
  ○ Please see me if you are not in the MS-BANA degree or certificate program

Student Outcomes
• Have the ability to create basic database structures
• Be able to use SQL to interact with data
• Perform exploratory data analysis using SQL
• Connect your relational databases to analytical tools

Course Format
Students will read class material, engage in lectures and demonstrations, and work in-class examples and homework problems and cases. Main lectures will consist of reviewing homework, presentations, live coding in SQL, and the usage of data tools (SSMS, R, and Tableau).
Required Software

- Microsoft SQL Server Express (Free Download: https://www.microsoft.com/en-us/sqlserver/editions/2012-editions/express.aspx)
- R (Open source. Available from: http://cran.case.edu/)
- Tableau (Tableau Public http://www.tableausoftware.com/)
- ER Diagram software, MySQL Workbench (https://www.mysql.com/products/workbench/)

Mac and Linux users: SQL Server Express and SAS run on Windows only. In order to run Windows applications, I recommend the use of Oracle’s VirtualBox, a free virtualization solution that will allow you to install and run Windows and Windows-based software on your Macintosh (Intel-based) or Linux computer. You can download the software and review system requirements at http://www.virtualbox.org. Microsoft Windows can be purchased at the University Bookstore for a nominal charge if needed. You may use other virtualization software if you would like, it is your responsibility to have an operating server on your personal laptop or desktop.

Expectations of Students

Students are expected to prepare and participate by:

1. Reading scheduled assignments each week
2. Participating in class discussions, projects and exams
3. Completing the assigned projects by the due date and time

Students are expected to complete each test, exam, homework, and all other assignments independently. The student’s submissions must represent his or her individual work, and citations must be provided where content from other sources is referenced.

Academic Integrity

If there is a question about the academic integrity of a submission, or if it is believed that a submission does not fully represent the unique work of the student or approved group members, the instructor will take all appropriate action in accordance with the college’s policy on Academic Misconduct and Plagiarism (http://www.uc.edu/conduct/Code_of_Conduct.html). This can include issuance of an “F” grade for the assignment, course, and/or could include removal from the program (plagiarism is a serious offense). Group projects should be collaborative only within your group and not shared between groups.

Performance Evaluation

Course grades will be determined as follows:

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Homework</td>
<td>40</td>
<td>400</td>
</tr>
<tr>
<td>Quizzes</td>
<td>30</td>
<td>300</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30</td>
<td>300</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>100</td>
<td>1,000 pts</td>
</tr>
</tbody>
</table>
Grading Scale

93% - 100%  A
90% - 92.9%  A-
87% - 89.9%  B+
83% - 86.9%  B
80% - 82.9%  B-
77% - 79.9%  C+
73% - 76.9%  C
70% - 72.9%  C-
Below 70%  D
Below 60%  F

All students have the same opportunity to earn points in the course. Any questions regarding grading of assignments, quizzes, or exams must be addressed within one week of return of the graded assignment, quiz or exam to the student.

Homework

Homework assignments given in this class are due by the date and time indicated in the syllabus or as indicated by the instructor.

Quizzes

There will be multiple quizzes during the course intended to evaluate students’ grasp of the material and progress towards student outcomes as stated at the beginning of the course.

Exams

The final exam will be cumulative covering all concepts covered during classes. The exam will consist of an in-class portion and a take home portion that will be due at the beginning of the scheduled exam time. Students will be expected to apply the course learning in completing both portions of the final exam.

Quizzes and exams must be taken and on the date specified in the course calendar unless the instructor grants approval of a make-up exam PRIOR to that date. Without prior approval, make-up opportunities are limited to documented emergencies. Instructor discretion is used in determining whether a situation constitutes an emergency.

Projects

Students might be assigned a class project designed to provide experience in applying the principles of the course to sample data. The performance evaluation scale will be adjusted if a class project is assigned.

Late Assignments

Late assignments will receive a deduction of 20% per day, beginning with a 20% deduction for assignments turned in past the date and time due. Assignments more than 2 days late will not be accepted. (Students can arrange different terms for certain emergencies/travel if appropriate notice is provided before the due date and time).
Adjustments to Assignments, Schedule, and Syllabus
The scope, timing, and due date/time of any assignments, projects, homework, exams, or any other required work may be adjusted by the instructor as needed to maximize learning opportunities for students and/or better serve the goals of the course. The syllabus may likewise be modified at the discretion of the instructors.

Any adjustments will be communicated to students in class and on Blackboard with as much advance notice as possible.
<table>
<thead>
<tr>
<th>Week # (Week of)</th>
<th>Topic</th>
<th>Assignments:</th>
</tr>
</thead>
</table>
| #1 Tuesday 1/12/2016 | Introduction to Databases  
Brief History of Databases  
Key Terms  
Relational Databases  
Normal Forms  
Data Types  
Entity Relationship Diagrams  
ETL | FOR NEXT CLASS:  
Homework #1: Entity Relationship case |
| #2 Tuesday 1/19/2016 | Database Tools and Practices  
Microsoft SQL Server Express  
Best Coding Practice  
SQL Basics I  
Creating Tables  
INSERT data  
Common SQL Syntax  
JOINs | Due 1/19/2016 @ 5PM:  
Homework #1  
ER Case  
FOR NEXT CLASS:  
Homework #2: SQL Basics I & JOINs |
| #3 Tuesday 1/26/2016 | Database Theory  
Table Design  
Data Anomalies  
SQL Basics II  
ALTER/UPDATE/DELETE/TRUNCATE  
CASE  
GROUP BY/ORDER BY  
Built-in Functions (Arithmetic, String)  
CAST/CONVERT  
Date & Time data | Due 1/26/2016 @ 5PM:  
Homework #2 SQL Basics I & JOINs  
FOR NEXT CLASS:  
Homework #3: SQL Basics II  
Quiz #1 JOINs & Intro to Databases |
| #4 | Quiz #1 JOINs & Intro to Databases  
Database Theory II  
Modular Code Design  
Isolation Levels  
SQL Advanced I  
OVER, PARTITION BY  
PIVOT, UNPIVOT  
Stored procedures  
Views  
Common Table Expressions | Due 2/2/2016 @ 5PM:  
Homework #3 SQL Basics II  
FOR NEXT CLASS:  
Homework #4 SQL Advanced I |
|---------------------------------|--------------------------------------------------|
| #5 | SQL Advanced II  
Variables  
IF, WHILE  
Cursors  
Dynamic SQL  
SSIS, SSAS, OLAP Cubes (TBD) | Due 2/9/2016 @ 5PM:  
Homework #4 SQL Advanced I  
FOR NEXT CLASS:  
Homework #5 SQL Advanced II  
Quiz #2 SQL Advanced I & II |
| #6 | Quiz #2 SQL Advanced I & II  
Using R with Databases  
R packages  
Final Exam Review  
Take home SQL Exam and Case Study assigned | Due 2/16/2015 @ 5PM:  
Homework #5 SQL Advance II  
FOR NEXT CLASS:  
Final Exam (in-class portion) |
| #7 | Final Exam (in-class portion)  
Open Discussion  
SQL Extensions (e.g. MySQL, PostgreSQL, Oracle, DB2, etc.)  
NoSQL databases  
Cloud Database offerings  
Distributed file systems | Due 2/23/2015 @ 5PM Final Exam: Take home portion |